Multimarket coopetition : how the interplay of competition and cooperation affects entry into shared markets

Coopetition, Multimarket Contact, and Market Entry: How Cooperation Affects the Competitive Dynamics between Rivals

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Abstract

While the growth in cooperative relations among rival firms is widely recognized, relatively little is known about how coopetition affects the competitive dynamics between rival firms. Bringing together ideas from multimarket contact theory and theory on inter-firm cooperation, the present study contributes to closing this gap. Specifically, we theorize how and why coopetition (the cooperative arrangements among rivals) affects both sides of an inverted-U-shaped relationship between multimarket contact and market entry. We test our ideas using airline industry data from 2004 to 2010 covering 38,184 firm-market-year observations in Europe, and find support for our hypotheses. We discuss the implications of our findings for current debates and future research.

Keywords: Coopetiton; cooperation; multimarket contact; market entry

Introduction

Coopetition, a situation where two firms cooperate and compete at the same time, has received significant research attention over the last decades (Bengtsson and Kock, 1999, 2000; Brandenburger and Nalebuff, 1996; Luo, 2007). Coopetition studies have investigated the paradoxical traits of the cooperation-competition dichotomy, and identified and analyzed the resulting tensions and their (positive and negative) effects on various organizational levels of analysis (Bengtsson and Kock, 2014; Dorn et al. 2016). Less attention has been directed at the behavioral, strategic implications for firms from their coopetitive relations.

Such implications, however, are suggested by multimarket contact theory, which is part of the competitive dynamics research stream of strategic management (Chen and Miller, 2012). Multimarket contact is a situation where rival firms meet in multiple markets (Barnett, 1993; Karnani and Wernerfelt, 1985; Yu et al., 2009) and implies a particularly high level of strategic interdependence between firms (Baum and Korn, 1999; Fuentelsaz and Gomez, 2006; Gimeno, 1999; Karnani and Wernerfelt, 1985). Specifically, studies have shown that a focal firm's inclination to enter a particular market is linked to firm's multimarket contact with rival incumbents already serving that market, and that this link has an intriguing inverted U-shape (Anand et al., 2009; Fuentelsaz and Gomez, 2006; Haveman and Nonnemaker, 2000; Stephan et al., 2003): Initially, a focal firm is more likely to enter a market as the level of multimarket contact with incumbents increases. Beyond some threshold, however, additional multimarket encounters with rival incumbents reduce the likelihood of competitive action in terms of market entry.

When suggesting an inversely U-shaped link between multimarket contact and market entry, theorists and researchers in the field have so far relied on purely competitive logics

(Haveman and Nonnemaker, 2000; Karnani and Wernerfelt, 1985; Yu and Cannella, 2013). Taking the increasing prevalence of coopetition as a point of departure, we suggest, however, that the extent of cooperation between rival firms (i.e. coopetition) needs to be considered when trying to understand the link between multimarket contact and market entry (behavioral implications). We do so by drawing on multimarket contact theory (e.g., Fuentelsaz and Gomez, 2006; Stephan et al., 2003) and theory on interfirm cooperation (e.g., Kang et al., 2009; Mayer and Argyres, 2004; Parkhe, 1993; Ring and Vandeven, 1994).

To test our hypotheses, we assembled an extensive longitudinal dataset from the airline industry. Finding support for our theoretical arguments, we observe that coopetition matters: cooperative relationships between rivals positively moderate the initially positive link and negatively moderate the downward turn of the slope constituting the inversely U-shaped relationship between multimarket contact and market entry.

Providing theoretical arguments and empirical evidence for an impact of cooperation on the link between multimarket contact and market entry, our study introduces the idea that coopetition is consequential for the multimarket dynamics between rival firms (Chen and Miller, 2012). Thus, it contributes to the literature on coopetition (Bengtsson and Kock, 2014; Gnyawali and Madhavan, 2001) by extending our knowledge on how coopetition shapes firms' competitive actions (Bengtsson and Kock, 2014; Gnyawali and Madhavan, 2001). In addition, our study answers the calls for a contingency perspective on how multimarket encounters relate to interfirm competitive dynamics (Fuentelsaz and Gomez, 2006; Yu and Cannella, 2013).

Theory and Hypotheses

Multimarket contact and market entry

Prior research has provided several lines of reasoning in support of the notion that multimarket encounters with rivals initially *increase* the likelihood of the firm entering a new market served by those same incumbent rivals (Stephan et al., 2003).

The first line of reasoning supporting this belief involves the notion of retaliation capacity. If a focal firm can establish a foothold in a new market where it meets the same rivals it faces elsewhere in other markets, the interdependence among these firms increases the focal firm's capacity to retaliate against potential competitive attacks from these incumbent firms (Fuentelsaz and Gomez, 2006). The presumed greater capacity for retaliation is based on the growing number and variety of markets served by both the attacking and defending firm (Baum and Korn, 1999; Karnani and Wernerfelt, 1985). For a focal firm, the strategic importance of its retaliation capacity is based on how the market encounters with respective rivals (Haveman and Nonnemaker, 2000), which results in an initial positive link between the multimarket encounters with rivals and the probability that a focal firm will enter a market where it meets these rivals.

The tendency to enter a market with rival incumbents with whom multimarket contact exists is further fueled by the fact that entering a market allows the focal firm to gather valuable knowledge about incumbents (Haveman and Nonnemaker, 2000; Stephan et al., 2003). When firms meet in markets, they make common experiences and attain information on each other's behaviors (Caves and Porter, 1977). Hence, entering a market served by incumbents helps a focal firm to expand its "database of competitive intelligence" (Stephan et al., 2003, p. 406) about rivals. Such information helps to predict rival's competitive behavior (Boeker et al., 1997; Haveman and Nonnemaker, 2000; Koçak and Özcan, 2013), which becomes more important

with their strategic importance indicated by multimarket contact (Fuentelsaz and Gomez, 2006; Haveman and Nonnemaker, 2000).

Finally, by entering a market already populated by incumbents with whom multimarket contact exists, a focal firm reduces the uncertainty inherent in entry moves (Stephan et al., 2003). Imitating the actions of firms that are similar from a strategic point of view makes use of the best information available on which markets have high potential for the focal firm. By following the behavior of important rivals, i.e. rivals with whom a focal firm has a considerable number of multimarket encounters (Fuentelsaz and Gomez, 2006; Haveman and Nonnemaker, 2000), the focal firm will likely enter markets that are particularly attractive and may thus avoid getting into an inferior competitive positon.

However, multimarket contact theory also suggests that beyond some threshold, further increases in multimarket contact will *reduce* a firm's likelihood to enter a particular market (Anand et al., 2009; Baum and Korn, 1999; Haveman and Nonnemaker, 2000). This phenomenon can be explained based on a combination of diminishing positive returns and additional negative returns to market entry for the focal firm. Consider the notion of gathering knowledge on rivals by means of establishing additional multimarket encounters. For example, when considering the competitive intelligence argument, once a focal firm has already accumulated a significant amount of knowledge on rival firms, the value of additional knowledge conveyed by yet another multimarket encounter should decrease (Stephan et al., 2003). Thus, there are diminishing returns of additional multimarket contact.

Additionally, as multimarket contact increases, deterrence begins to operate effectively, which leads firms to mutually forbear from potentially aggressive actions, such as market entry (Fuentelsaz and Gomez, 2006; Jayachandran et al., 1999). As an aggressive act, market entry

may result in counterattacks by incumbents, such as price cuts or aggressive marketing campaigns (Karnani and Wernerfelt, 1985) in all those markets in which these firms operate (Jayachandran et al., 1999). Consequently, the potential damage caused by such retaliation thus increases with the number of multimarket encounters between firms, which is a deterrent to market entry (Edwards, 1955; Fuentelsaz and Gomez, 2006; Jayachandran et al., 1999).

Summing up, these arguments suggest that an increasing number of multimarket contact with incumbent firms yields positive but diminishing returns on the one hand and negative returns on the other. Based on this notion, prior research has suggested and found that the relationship between multimarket contact and the decision to enter new markets can be best described as an inverted-U (Anand et al., 2009; Koçak and Özcan, 2013; Stephan et al., 2003).

Coopetition and the relationship between multimarket contact and market entry

As noted above, the presumed curvilinear relationship between multimarket contact and market entry is derived from a competitive logic. While we neither dispute the relevance of this logic nor the fact that the link between multimarket contact and market entry may generally follow an inverted U, we suggest that this link will be affected by the extent of cooperation between the focal firm and rival incumbents, turning their competitive relationship into a coopetitive one.

Specifically, we will first discuss why we expect a focal firm's cooperative arrangements with rivals to weaken the presumed initial positive relationship between multimarket contact and market entry (H1). We then delineate why we expect cooperation between rivals to also weaken the presumed negative effect of multimarket encounters on market entry after a threshold (H2). In other words, we develop and test the notion that cooperation between rival firms exerts an

attenuating effect on the inverted-U relationship between multimarket contact and new market entry.

Cooperation and the initially positive link

As noted above, one benefit that should accrue to a focal firm considering whether to enter a new market populated with incumbents that the focal firm already meets in other markets, is the opportunity to gain additional knowledge and information on these rivals (Haveman and Nonnemaker, 2000; Stephan et al., 2003). However, as the amount of knowledge grows, this benefit is likely to be subject to diminishing returns beyond a certain point (Deeds and Hill, 1996; Stephan et al., 2003). Here, we introduce the notion that cooperation between rivals affects the accumulated knowledge that a focal firm has vis-à-vis rivals.

The alliance literature has widely recognized that cooperative relationships increase the stocks of partner-related knowledge (Das and Teng, 2000; Khanna et al., 1998). When cooperative relationships are established, firms spend time to negotiate their cooperative arrangement, learn about the partner's strategic priorities, decision making processes, communication standards and corporate culture (Ring and Van De Ven, 1994). Once a cooperative relationship is formed, regular interaction, and eventual renegotiations of the terms and conditions for cooperating further increase the amount of the partner-specific knowledge accumulated (Hoang and Rothaermel, 2005; Mayer and Argyres, 2004; Zajac and Olsen, 1993). Additionally, an increasingly dense network of boundary-spanning ties between partner organizations develops (Albers et al., 2016), which further increases the exchange of information and knowledge between partners (Khanna et al., 1998).

Taken together, the arguments highlight how cooperative arrangements between rivals serve to increase the body of available knowledge regarding rivals. Given that such knowledge is likely to be at least partially redundant with the the knowledge associated with new multimarket encounters, we expect cooperation between a focal firm and incumbents to reduce the value of new multimarket encounters resulting from entering a market with rival incumbents. Thus, we expect the extent of cooperation between rivals to negatively moderate the initial positive link between multimarket contact and market entry established in prior research. We thus propose:

Hypothesis 1: The extent of cooperation between a focal firm and incumbent rivals negatively moderates the initially positive link between multimarket contact and market entry.

Cooperation and the downward turn of the slope

We also see cooperation to affect the downward turn of the inverted-U-shaped relationship between multimarket contact and market entry. As outlined above, a focal firm contemplating whether to enter a market populated by incumbents considers the risk involved in potential incumbent retaliation (Fuentelsaz and Gomez, 2006). Since this risk increases with the number of multimarket encounters with incumbent firms, it increasingly serves as a deterrent for competitive action, thus reducing the probability that a focal firm will enter that market when multimarket contact with incumbents increases (Baum and Korn, 1996, 1999; Haveman and Nonnemaker, 2000). While not discounting this general relationship, we suggest that deterrence is likely attenuated when there is cooperation between a focal firm and incumbents.

Specifically, we first consider the relevance of opportunity costs associated with terminating cooperation arrangements. Given that firms enter cooperative relations to jointly

realize competitive advantages (Das and Teng, 1998; Dyer and Singh, 1998), terminating cooperation is costly, even if an alternative cooperative arrangement with another firm may be established. In the process of developing a cooperative tie, firms develop partner-specific routines and procedures (McEvily and Marcus, 2005). Such routines and procedures effectively reduce coordination and transaction costs incurred in the interaction between partners, and are a major source of relational rents (Dyer and Singh, 1998; Uzzi, 1996). Given the value of cooperative relationships, incumbents with whom a focal firm cooperates will likely refrain from counterattacking when a focal firm enters a market in which they are already present. In this way, we see cooperation as reducing the risk of incumbent retaliation.

The existence of a cooperative arrangement between the focal firm and incumbents can also decrease the risk of retaliation through a different mechanism. Specifically, the knowledge gained from cooperation with incumbent firms should further decrease the risk of retaliation by providing a focal firm with a better idea as to which markets are safe to enter, i.e., which are associated with a relatively lower risk of retaliation by incumbents. Superior knowledge on incumbents' strengths, weaknesses, and strategic priorities should enable a focal firm to avoid market entry moves that will result in harmful counterattacks by incumbents.

Taken together, these arguments suggest that cooperation also affects the downward turn of the inverted-U-shaped relationship between multimarket contact and market entry. Specifically, we expect that, mitigating the risk of retaliation, focal firm cooperation with incumbents will exert a positive moderating effect on the downward turn of the slope describing the relationship between multimarket contact and market entry. We thus propose:

Hypothesis 2: The extent of cooperation between a focal firm and rival incumbents positively moderates the downward turn of the slope describing the relationship between multimarket contact and market entry.

Figure 1 illustrates our expectation on how the extent of cooperation with rival firms will affect the inverted-U-shaped relationship between multimarket contact and market entry across all levels of that relationship. To summarize, we expect a focal firm's cooperative arrangements with rivals to mitigate the initial positive effect of multimarket encounters on market entry (H1) and to mitigate the later decreases in the probability of such competitive action resulting from multimarket contact with incumbents in that market (H2).

Insert Figure 1 about here

Data and Method

Sample

Following prior multimarket contact research (e.g., Baum and Korn, 1996, 1999; Evans and Kessides, 1994; Gimeno and Woo, 1996), we relied on longitudinal data from the airline industry to test our hypotheses. Airline industry data is particularly well suited for addressing the consequences of multimarket encounters, as flight information is clearly assigned to geographical markets and thus allows for objectively calculating firms' multimarket contact (Baum and Korn, 1996, 1999; Evans and Kessides, 1994; Gimeno and Woo, 1996). Additionally, cooperative relationships among rival firms are quite common in the aviation industry (Garrette et al., 2009; Goedeking, 2010), which is crucial for addressing the effect suggested in our study.

While competing on most routes, airlines often simultaneously have codeshare agreements related to particular regional markets, meaning that they cooperate on an operational level to offer the same flight to their respective customers (Wassmer and Dussauge, 2012). As such, codeshare agreements require airlines to share knowledge and information about the potential of that particular market, as well as to jointly develop the route and agree on capacities (Lazzarini, 2007). Additionally, several airlines have formed strategic alliance networks to cooperate by offering their customers joint loyalty programs and joint terminal lounges (Doganis, 2006). Joint alliance network membership thus typically comprises joint activities in areas such as marketing and capacity planning, a coordinated route network development and joint traffic rights administration, and also involves setting up and operating shared terminal facilities and maintenance bases (Doganis, 2006).

Our study rests on data from different sources. Basic flight information, such as origin, destination, distance, passenger capacity, and the name of the airline offering the flight, was obtained from the Official Airline Guide (OAG). The OAG database also contains information on codeshare agreements, i.e. market-specific cooperative agreements between airlines (Wassmer and Dussauge, 2012). Data on airlines' membership in alliance networks, i.e. Star Alliance, Skyteam, and Oneworld, was obtained from *Airline Business*, the leading airline industry journal.

Analyses are based on data from the flight schedule related to all European markets (i.e., city-pair connections) in one representative week per year from 2004 to 2010. We focused on entry into European markets, as the European Common Aviation Area (ECAA) provides a unified regulatory regime for market entry in European countries (Doganis, 2010). In total, our data cover 10,347 market entries conducted by 204 airlines in 4,739 markets. Our analyses rest

on 38,184 firm-market-year observations with firms either being “at risk” of entering or entering a particular market in that year.

Variables

Dependent variable

Following earlier research (Anand et al., 2009; Haveman and Nonnemaker, 2000), we constructed a dummy variable that takes the value of 1 when an airline entered a market, and 0 otherwise. Market entry is indicated when a firm is active in a market n in a particular year (t+1), but not the year before (t).

Independent variable

We followed Fuentelsaz and Gomez (2006), and relied on the relative firm-in-market count measure established by Gimeno and Woo (1996) to capture *multimarket contact* between a focal firm and incumbents populating a market n. To calculate this measure, we first counted the total number of multimarket encounters of a focal firm i with every incumbent j in market n, considering all markets m other than n. The following expression formally represents the resulting measure:

$$MMC\_Inc_{ijnt} = \sum_{m} I_{imt} \times I_{jmt} \times I_{jnt}$$

In this expression, indicator I_{imt} takes the value of 1 when the focal firm i is present in market m and 0 otherwise. I_{jmt} takes the value of 1 when firm j is present in market m and 0 otherwise. I_{jnt} takes the value of 1 if firm j is present in market n for which multimarket contact is computed, and 0 otherwise.

In a next step, we summed the number of multimarket encounters of the focal firm i with all incumbents j populating market n. The resulting measure is formally represented by:

$$MMC\_Mar_{int} = \sum_{j} MMC\_Inc_{ijnt}$$

Following Fuentelsaz and Gomez (2006), as well as Gimeno and Woo (1996), we then constructed *multimarket contact*$_{int}$ as reflecting the average number of market encounters between the focal firm i with incumbents j in a particular market n by dividing *MMC_Mar*$_{int}$ by the total number of incumbents populating market n *(Inc*$_{nt}$*)*.

$$Multimarket\ contact_{int} = \frac{MMC\_Mar_{int}}{Inc_{nt}}$$

Moderator

To capture the extent of *cooperation* between a focal firm and incumbents populating a particular market, we constructed two measures.

Our first measure, *cooperation (CS)*$_{int}$, indicates the extent of cooperation between a focal firm i and incumbents j in market n based on codeshare agreements. We constructed this measure in three steps. First, we calculated an indicator reflecting the total number of codeshare agreements of a focal firm i with incumbent j in market n:

$$Code\_Inc_{ijnt} = \sum_{m} I_{imt} \times I_{jmt} \times I_{jnt} \times I_{c[ij]mt}$$

Indicators $I_{imt,}$ I_{jmt} and I_{jnt} were previously defined, $I_{c[ij]mt}$ takes on the value of 1 if the focal firm i and incumbent j had a codeshare agreement for market m in t. In the next step, we divided *Code_Inc*$_{ijnt}$ by the total number of multimarket encounters between the two firms *(MMC_Inc*$_{ijnt}$*)* to get a relative term ranging between 0 and 1 that indicates the extent of cooperation with a particular incumbent. Then, we summed the weighted incumbent-specific measures over all

incumbents j in market n. The weighting factor reflects the relative strategic importance of incumbent j relative to all other incumbents in market n. The factor is indicated by the ratio of the multimarket encounters between the focal firm i and incumbent j *(MMC_Inc$_{ijnt}$)* relative to the total number of multimarket encounters between i and all incumbents j in market n *(MMC_Mar$_{int}$)*. The following formula formally represents our final measure:

$$Cooperation\ (CS)_{int} = \sum_{j} \left(\frac{Code\_Inc_{ijnt}}{MMC\_Inc_{ijnt}} \times \frac{MMC\_Inc_{ijnt}}{MMC\_Mar_{int}} \right)$$

Our second measure, *cooperation (AL)$_{int}$*, is based on joint membership in a strategic alliance network. To construct the measure, we considered a relation between the focal firm i and incumbent j as cooperative if both are members of the same alliance network. In the expression below, joint alliance network membership is represented by $I_{a[ij]mt}$, which takes the value of 1 if the focal firm i and incumbent j are members of the same alliance network in t, and 0 otherwise. In constructing our measure, we again accounted for the relative strategic importance of incumbent j relative to all incumbents j in market n by resorting to the weighting factor described above. The following formula formally represents our second measure:

$$Cooperation\ (AL)_{int} = \sum_{j} \left(I_{a[ij]t} \times \frac{MMC\_Inc_{ijnt}}{MMC\_Mar_{int}} \right)$$

Correlation analyses revealed that the two measures are distinct but correlated. Specifically, we observe a significant correlation ($r = 0.42$, $p < 0.01$) between *cooperation (CS)$_{int}$* and *cooperation (AL)$_{int}$*, which points to the fact that airlines tend to more likely engage in codeshare agreements with members of the same alliance network.

Controls

In our analysis, we controlled for several firm-related and market-related characteristics, as well as potential time-related influences that may affect firms' inclination to enter particular markets. Larger firms have more resources, experience lower market entry barriers and may thus more likely expand their scope of operations by entering new markets (Haveman and Nonnemaker, 2000). Following earlier research (Anand et al., 2009; Fuentelsaz and Gomez, 2006), we thus controlled for *firm size*$_{it}$ by employing Baum & Korn's (1996) measure of total flights carried out by an airline per year. Just as other firms (Wiklund and Shepherd, 2003), airlines may also differ with respect to their inclination to expand their scope of operations (Baum and Korn, 1996). We thus controlled for *firm's inclination to expand*$_{it}$, based on the firm's market entries relative to the number of markets served.

To control for differences in general market attractiveness, as well as the attractiveness of a market for a particular focal firm, we included several additional variables. First, we followed Baum and Korn (1996) by including the total *number of entries*$_{nt}$ in a particular market and accounting for *market centrality*$_{nt}$, in terms of the proportion of all flight destinations that are connected with the respective market. Also based on Baum and Korn (1996), we controlled for *firm-specific market centrality*$_{int}$, by including a measure that reflects the proportion of all flight destinations a focal airline serves from that respective market. To reflect the degree of competition in a particular market, which may influence market entry (Anand et al., 2009), we also controlled for the number of *incumbents*$_{nt}$ in that market and the average number of *flights in market per incumbent*$_{nt}$. In addition, we included dummy variables for each *year* to account for time fixed-effects (Anand et al., 2009; Zhang and Gimeno, 2010).

Analytical approach

Our study rests on longitudinal data and our dependent variable, market entry, is binary in nature. At least in our setting, market entry is neither an inevitable nor a terminal outcome.[1] Following earlier multimarket research (Anand et al., 2009), we thus resorted to a conditional fixed-effect panel logit model specification to test our hypotheses. The model included fixed effects for firm-market combinations to control for related time invariant unobserved heterogeneity (Wu, 2013; Zhang and Gimeno, 2010). We further employed Huber-White sandwich estimates of variance to avoid biased standard errors (Williams, 2000; Wooldridge, 2012).

Results

Table 1 shows the descriptive statistics for the variables in our analysis. Our control variables show the expected relationships with market entry.

Insert Table 1 about here

For instance, we find *firm's inclination to expand*$_{it}$ to be positively correlated with *market entry*$_{int}$ ($r = 0.28$, $p < 0.01$). In addition, the *number of entries*$_{nt}$ in a particular market, which indicates the attractiveness of the market for all firms, is correlated with our dependent variable ($r = 0.43$, $p < 0.01$). Similar to what has been observed in prior multimarket contact research (e.g., Anand et al., 2009; Fuentelsaz and Gomez, 2006; Haveman and Nonnemaker, 2000), we also find multimarket contact to be significantly related with *market entry*$_{int}$ ($r = 0.06$, $p < 0.01$). We further find significant correlations between our two measures of *cooperation*$_{int}$ and our

[1] In the timespan covered by our data almost 26 % of the airlines in our sample entered, exited, and reentered particular markets.

independent variable ($r = 0.19$, $p < 0.01$; $r = 0.39$, $p < 0.01$, respectively), which points to the fact that firms with a higher level of strategic interdependence more likely cooperate.

Despite these significant correlations, and the fact that our analyses include multiple interaction terms, we are confident that multicollinearity is not a significant issue in our study. The highest mean variance inflation factor (VIF) across all our models is 2.16 and the maximum VIF we encountered is 5.63, thus staying well below the widely recognized threshold of 10 (Wooldridge, 2012). Examination of the condition number (Belsley et al., 2005) further alleviates multicollinearity concerns. Across all models, the highest condition number observed was 5.89 and thus significantly below the widely acknowledged thresholds of 30 (Belsley et al., 2005; Cohen et al., 2003).

Hypotheses tests

Results from our hypotheses tests are presented in Table 2. Model 1 includes our control variables only.

Insert Table 2 about here

Model 2 also includes the linear and squared terms representing multimarket contact. Models 3 further includes the interaction between multimarket contact and the extent of cooperation reflected by *cooperation (CS)*$_{int}$. Similarly, Model 4 includes the interaction between multimarket contact and the extent of cooperation as indicated by *cooperation (AL)*$_{int}$.

Model 2 reveals the expected inverted U-shaped relationship between multimarket contact and the probability that a focal firm enters a particular market. Specifically, we observe a

significant positive effect of the linear term representing multimarket contact, i.e. *multimarket* $contact_{int}$ (β = 1.25, $p < 0.001$) and a negative effect of the squared term representing multimarket contact, i.e. *multimarket* $contact_{int}^2$ (β = -0.25, $p < 0.001$). Showing predicted probabilities for market entry, Figure 2 illustrates this result.

Insert Figure 2 about here

Hypothesis 1 stated that the extent of cooperation of a focal firm with incumbents negatively moderates the initially positive link between multimarket contact and market entry. Whereas Model 3 lends no support for Hypothesis 1, Model 4 reveals the suggested negative interaction of *cooperation* $(AL)_{int}$ and *multimarket* $contact_{int}$ (β = -0.20, $p < 0.01$).

Hypothesis 2 proposed that the extent of cooperation between a focal firm and incumbents positively moderates the downward turn of the inverted-U-shaped relationship between multimarket contact and a focal firm's probability of entering a particular market. Models 3 and 4 reveal significant positive interaction effects of *multimarket* $contact_{int}^2$ and *cooperation* $(CS)_{int}$ (β = 0.005, $p < 0.01$), as well as *cooperation* $(AL)_{int}$ (β = 0.08, $p < 0.001$), which lend support for Hypothesis 2.

Figure 3 illustrates the interaction results presented above. Each graph in Figure 2 shows the predicted probabilities for market entry dependent on multimarket contact for two values (one standard deviation above and one standard deviation below the mean) of *cooperation* $(CS)_{int}$ and *cooperation* $(AL)_{int,}$ respectively.

Insert Figure 3 about here

To illuminate the size of our interaction effects, we assessed the differences in marginal effects (Kotha et al., 2011) of multimarket contact on market entry across different levels of cooperation. To do so, we first calculated the marginal effects of *multimarket contact*$_{int}$ for different levels of multimarket contact and cooperation. For each level of multimarket contact (i.e. from two standard deviations below the turning point to two standard deviations above the turning point), we then estimated the percentage change in the marginal effect that resulted from increasing the level of cooperation from low to high (i.e. from one standard deviation below to one standard deviation above the mean).

Insert Table 3 about here

Consistent with the insignificant interaction between *cooperation (CS)*$_{int}$ and *multimarket contact*$_{in}$, Table 3 first of all reveals an inconclusive pattern on how increases in *cooperation (CS)*$_{int}$ affect the marginal effects of *multimarket contact*$_{int}$ when multimarket contact is low or very low. In line with our regression results, increases in *cooperation (CS)*$_{int}$ alleviated the negative marginal effects of *multimarket contact*$_{int}$, when multimarket contact is high or very high (by 83.76% and 73.88%, respectively). Table 3 further reveals that when multimarket contact is very low or low, increasing *cooperation (AL)*$_{int}$ decreases the positive marginal effect of *multimarket contact*$_{int}$ on market entry by 52.01% and 30.69%, respectively. Similarly, we observe that when multimarket contact is high or very high, increasing *cooperation (AL)*$_{int}$ alleviates the negative marginal effect of *multimarket contact*$_{int}$ by 85.52% and 63.13%.

To further elaborate on how cooperation affects the link between multimarket contact and market entry, we tested whether the coefficients of our interaction terms based on the two measures applied differ significantly. To do so, we resorted to a generalized, cross-estimator, cross-model Hausman test (Clogg et al., 1995; Hausman, 1978; Weesie, 1999), which allows for testing coefficient differences across models based on the same data (Singh and Fleming, 2010; Weesie, 1999). Analysis revealed significant differences. Specifically, we found the interaction effect of *cooperation (CS)*$_{int}$ and *multimarket contact*$_{int}$ to be significantly smaller than the interaction effect of *cooperation (AL)*$_{int}$ and *multimarket contact*$_{int}$ ($\chi^2 = 8.38$, $p < 0.01$). Similarly, we observed the interaction effects of *cooperation (CS)*$_{int}$ and *multimarket contact*$_{int}^2$ to be significantly smaller than the interaction effect of *cooperation (AL)*$_{int}$ and *multimarket contact*$_{int}$ ($\chi^2 = 6.24$, $p < 0.05$). We will return to this finding in our Discussion.

Robustness checks

We conducted several checks to assess the robustness of our results. First, we reran our models based on a model specification that includes random-instead of fixed-effects for firm-market combinations, as well as an additional model including random-effects for firm-market combinations as well as firm fixed-effects. Results confirmed the ones presented above. We also found similar results based on an alternative operationalization of multimarket contact. Specifically, we reran all our analyses replacing the relative firm-in-market count measure established by Gimeno and Woo (1996) and utilized in our main analyses with *MMC_Mar*$_{int}$, which represents the total number of multimarket encounters with incumbents in a particular market. Further, we reran our models additionally including the standard deviations of *multimarket contact*$_{int}$ and *cooperation (CS)*$_{int}$ and *cooperation (AL)*$_{int,}$ respectively. Including

these variables accounts for the fact that the markets considered in our data are typically populated by multiple incumbents (4.11 incumbents on average) across which multimarket contact as well as the extend of cooperation may vary considerably. Results from these additional analyses also confirmed the ones reported above.

Discussion and Conclusion

The present study offers a novel perspective to the coopetition literature by bringing together ideas from multimarket contact theory (Barnett, 1993; Karnani and Wernerfelt, 1985; Yu et al., 2009) with arguments from the literature on inter-firm cooperation (e.g., Kang et al., 2009; Parkhe, 1993; Ring and Vandeven, 1994). We began by noting that while there has been considerable research on how multimarket contact affects the competitive dynamics between rivals, this research has relied on purely competitive logics (Haveman and Nonnemaker, 2000; Karnani and Wernerfelt, 1985; Yu and Cannella, 2013). Against this backdrop, we argued that coopetition has significant consequences for firms' strategic behavior and thus, needs to be considered when trying to understand the link between multimarket contact and market entry.

Using extensive data from the airline industry, we were able to first replicate the inverted U-shaped relation between multimarket contact and market entry, similar to the result found in other industries, such as financial services (Fuentelsaz and Gomez, 2006; Haveman and Nonnemaker, 2000), biotechnology (Anand et al., 2009), or healthcare (Stephan et al., 2003). More importantly, however, we hypothesized and found that the extent of cooperation between a focal firm and its incumbent rivals moderated this inverted-U relationship, both in terms of the initial positive link between multimarket contact and market entry as well as the negative relationship between multimarket contact and market entry.

By introducing theoretical arguments and empirical evidence for how cooperation affects the interaction between multimarket rivals, we see our study as providing an original contribution to the literatures on coopetition (Bengtsson and Kock, 2014; Gnyawali and Madhavan, 2001) and competitive dynamics (Chen and Miller, 2012). Highlighting the impact of coopetition for the consequences of multimarket contact, we also provide new evidence regarding the relevance of mechanisms such as knowledge acquisition, retaliation and deterrence for explaining the link between multimarket contact and market entry.

In terms of the first part of the inverted-U relationship, our results support the notion that firms are motivated to enter markets to acquire additional knowledge on incumbent firms with whom they have existing multimarket contact (Stephan et al., 2003). We extend this insight to suggest that firms will similarly learn more about each other through establishing alliances (Das and Teng, 2000; Khanna et al., 1998; Zajac and Olsen, 1993). Of course, the value of additional knowledge on incumbents decreases with the amount of knowledge already available (Deeds and Hill, 1996; Hoang and Rothaermel, 2005). As a result, we argued and found that the extent to which a focal firm cooperates with incumbent rivals, the growing redundancy of information gained from cooperation and from new market entry will serve to attenuate the initially positive relationship between multimarket contact and new market entry. Regarding the negative link between multimarket contact and market entry beyond some threshold, our results support the view that cooperation serves to reduces the risk of retaliation that is presumed to deter new market entrants that meet incumbents in a large number of other markets. Specifically, we suggested that due to the costs associated with terminating cooperative relationships (Kang et al., 2009; McEvily and Marcus, 2005), along with the increased ability of a focal firm to predict the strategic reactions of incumbents in particular new markets, cooperative interfirm relations will

decrease the retaliation risk associated with market entry.

These ideas are further underlined by our differential results for the different measures applied to indicate cooperation. Analyses suggested that the extent of cooperation indicated by codeshare agreements has a weaker moderating effect than the extent of cooperation indicated by joint alliance network membership. Codeshare agreements constitute cooperation on an operational level that refers to a particular market (Wassmer and Dussauge, 2012). As such, they require airlines to share knowledge and information about the appraised potential of that particular market, as well as to jointly develop the route and agree on capacities (Lazzarini, 2007). Alliance network membership, in contrast, usually involves at least a certain degree of co-mingling of assets (Doganis, 2006), which is typically associated with the exchange of knowledge that is rooted deeply in the organization (Mowery et al., 1996). It is thus plausible to assume that joint alliance membership results in more knowledge and information on incumbent firms than codeshare agreements.

Showing that cooperation between firms moderates the link between multimarket contact and market entry, our study adds to the contingency perspective on multimarket competitive dynamics (Fuentelsaz and Gomez, 2006; Yu and Cannella, 2013) and contributes to a more differentiated and contextualized understanding of coopetition (e.g., Bengtsson and Kock, 2014; Dorn et al. 2016).

We acknowledge some limitations of our study that may be addressed by future research. First, we tested our hypotheses based on data from one particular industry. Even though the airline industry is particularly suited for conducting multimarket contact research (Baum and Korn, 1996, 1999; Gimeno and Woo, 1996) and is an acknowledged context for studying coopetition (Chiambaretto and Dumez, 2016; Czakon and Dana, 2013), future research may want

to replicate our findings based on data from other industries. Considering that we join previous multimarket studies in focusing on entry in geographical markets, future research may want to address whether our results also hold for firms' decision to enter new product markets. Finally, our study provides evidence for the notion that different scopes and intensities of cooperation (and hence coopetition) affect multimarket competitive dynamics. However, future research may also want to further elaborate on how coopetition affects other phenomena in the field of competitive dynamics, such as firms' action repertoire configurations (Ferrier and Lee, 2002; Ferrier et al., 1999), identity domain definitions (Livengood and Reger, 2010), and competitive acumen (Tsai et al., 2011).

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Table 1: Descriptive statistics and correlations

N = 38,184	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Market entry$_{int}$	0.27	0.44										
2. Firm size$_{it}$	3216.96	4069.07	0.01									
3. Firm's inclination to expand$_{it}$	0.24	0.18	0.28	-0.29								
4. Flights in market per incumbent$_{nt}$	13.43	10.17	-0.05	-0.04	-0.11							
5. Number of entries$_{nt}$	0.96	1.17	0.43	-0.02	0.10	0.18						
6. Number of incumbents$_{nt}$	4.11	3.96	-0.02	-0.13	-0.05	0.35	0.31					
7. Market centrality$_{nt}$	0.01	0.01	-0.04	-0.05	-0.05	0.18	0.06	0.24				
8. Firm-specific market centrality$_{int}$	0.04	0.09	0.03	-0.17	0.08	-0.00	-0.02	-0.04	0.23			
9. Multimarket contact$_{int}$	28.54	34.82	0.06	0.29	-0.19	-0.08	-0.05	-0.16	-0.02	-0.07		
10. Cooperation (CS)$_{int}$	0.18	0.29	0.02	0.08	-0.15	0.14	0.03	0.07	-0.01	-0.00	0.19	
11. Cooperation (AL)$_{int}$	0.21	0.38	0.04	0.10	-0.17	0.23	0.08	0.19	0.13	-0.04	0.39	0.42

Notes. Means and standard deviations based on unstandardized variables; correlations with $r > |0.02|$ are significant on $p < 0.01$.

Table 2: Results from hypotheses testing

N = 38,184	Model 1	Model 2	Model 3 (CS)	Model 4 (AL)
Firm size$_{int}$	2.72***	2.37***	2.37***	2.43***
	(0.19)	(0.19)	(0.19)	(0.19)
Firm's inclination to expand$_{it}$	0.83***	0.92***	0.92***	0.93***
	(0.03)	(0.03)	(0.03)	(0.03)
Flights in market per incumbent$_{nt}$	0.23***	0.19***	0.19**	0.16*
	(0.06)	(0.06)	(0.06)	(0.06)
Number of entries$_{nt}$	1.99***	2.02***	2.02***	2.04***
	(0.05)	(0.05)	(0.05)	(0.05)
Number of incumbents$_{nt}$	2.97***	3.00***	3.00***	2.94***
	(0.14)	(0.14)	(0.14)	(0.14)
Market centrality$_{nt}$	-0.15	-0.08	-0.08	-0.01
	(0.14)	(0.14)	(0.14)	(0.14)
Firm-specific market centrality$_{int}$	0.28***	0.23***	0.21**	0.22**
	(0.07)	(0.07)	(0.07)	(0.07)
Multimarket contact$_{int}$		1.25***	1.26***	1.17***
		(0.07)	(0.08)	(0.08)
Multimarket contact$_{int}^2$		-0.25***	-0.28***	-0.29***
		(0.02)	(0.02)	(0.02)
Cooperation$_{int}$			0.10*	0.59*
			(0.04)	(0.07)
Cooperation$_{int}$ × Multimarket contact$_{int}$			-0.03	-0.20**
			(0.05)	(0.06)
Cooperation$_{int}$ × Multimarket contact$_{int}^2$			0.05**	0.08***
			(0.02)	(0.02)
Log-likelihood	-5,232	-5,048	-5,033	-4,950
Chi^2	3,250	3,198	3,221	3,176
AIC	10,488	10,124	10,100	9,935

Notes. Standard errors in parentheses. All models include year dummies.

* $p < 0.5$; ** $p < 0.01$; *** $p < 0.001$

Table 3: Differences in marginal effects

	CS	MMC				AL	MMC			
		very low	low	high	very high		very low	low	high	very high
Marginal effects	low	+0.61%	+0.15%	-0.50%	-1.14%	low	+0.75%	+0.17%	-0.81%	-0.97%
	high	+0.57%	+0.18%	-0.08%	-0.30%	high	+0.36%	+0.12%	-0.12%	-0.36%
Difference between marginal effects (in percent)		-7.58%	+26.24%	+83.76%	+73.88%		-52.01%	-30.69%	+85.52%	+63.13%

Figure 1: Hypothesized relationships

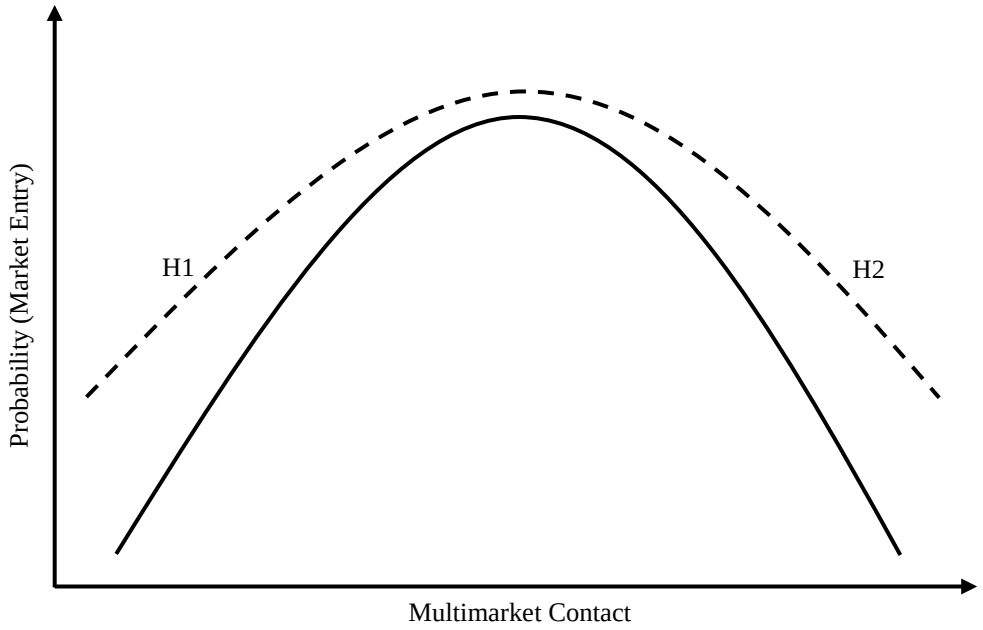

Figure 2: Multimarket contact and market entry

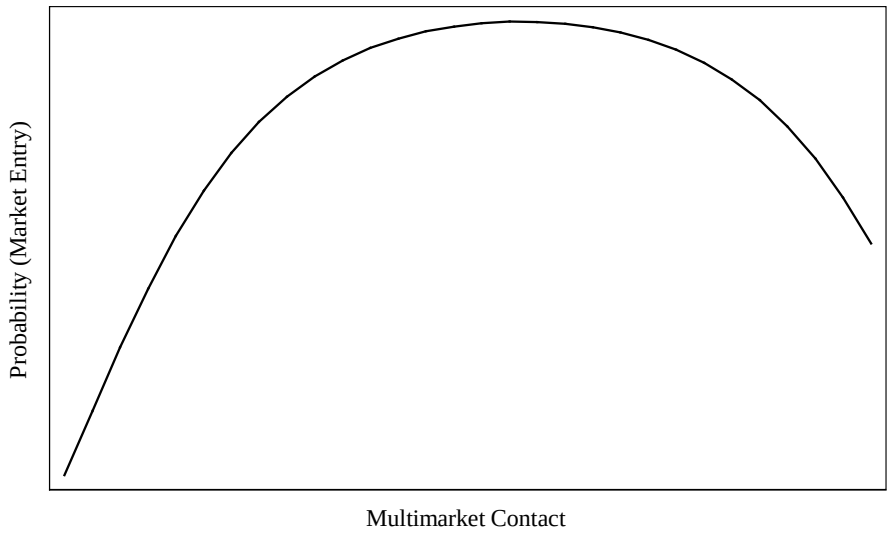

Figure 3: Moderating effect of the extent of cooperation